

CLAIMS

1. A method for improving surface thermal shock resistance of a member made of ceramics to which thermal shock resistance is required comprising, forming homogeneously distributed linear dislocation structure on the surface of the member made of ceramics to which thermal shock resistance is required by blasting abrasives composed of fine particles whose average particle size is from $5\mu\text{m}$ to $200\mu\text{m}$ and whose surface shape is convex, wherein Vickers hardness (HV) of said fine particles is 800 or more and equal to or less than the hardness of the member made of ceramics to which thermal shock resistance is required.

2. The method for improving surface thermal shock resistance of a member made of ceramics to which thermal shock resistance is required of claim 1, wherein the homogeneously distributed linear dislocation on the surface of the member made of ceramics to which thermal shock resistance is required forms a dislocation structure whose dislocation density is measured with the transmission electron microscope and is from 1×10^4 to $9 \times 10^{13}\text{cm}^{-2}$.

3. The method for improving surface thermal shock resistance of a member made of ceramics to which thermal shock resistance is required of claim 1, wherein plastic working is carried out by blasting pressure; $0.1 - 1.0\text{MPa}$, blasting rate; $20\text{m/sec} - 250\text{m/sec}$, blasting amount; $50\text{g/min} - 800\text{g/min}$, blasting time; $1\text{sec/cm}^2 - 60\text{sec/cm}^2$.

4. The method for improving surface thermal shock resistance of a member made of ceramics to which thermal shock resistance is required of claim 3, wherein the homogeneously distributed linear dislocation on the surface of the member made of ceramics to which thermal shock resistance is required forms a dislocation structure whose dislocation density is measured with the transmission electron microscope and is from 1×10^4 to $9 \times 10^{13}\text{cm}^{-2}$.

5. A thermal shock resistance member comprising, a substrate composing a member made of ceramics to which thermal shock resistance

is required is at least one selected from the group consisting of alumina, silicon nitride, SiALON, aluminum nitride or silicon carbide, forming a structure of dislocation density from 1×10^4 to $9 \times 10^{13} \text{cm}^{-2}$ of homogeneously distributed linear dislocation.

6. The thermal shock resistance member of claim 5, wherein the member made of ceramics to which thermal shock resistance is required is a dome for etcher, an electrostatic chuck, a vacuum chuck, a susceptor, a handling arm, a dummy wafer, a heater for wafer heating, window of a high temperature reaction furnace, a reaction tube of diffusion furnace, a wafer boat, a thermocouple protecting tube, a radiant tube for aluminum alloy melting, a stoke for low pressure casting, a stirring propeller for aluminum alloy melting, sleeve for die cast, piping component, a high temperature bearing, a shaft, a heat sink substrate for power module, a heat radiation insulated substrate and a turbine blade.